LELEC2531

2015-2016

Design and Architecture of digital electronic systems

5.0 credits	30.0 h + 30.0 h	1q

Teacher(s) :	Legat Jean-Didier ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	Moodle > http://moodleucl.uclouvain.be/enrol/index.php?id=4
Main themes :	Combinational logic circuits and sequential logic design. Digital building blocks (ALU, registers, ...).Hardware description language (SystemVerilog). Microarchitecture of a 32-bit RISC processor (single-cycle processor, multicyle processor and pipelined processor). Embedded processor architecture and I/O systems.
Aims :	With respect to the AA referring system defined for the Master in Electrical Engineering, the course contributes to the development, mastery and assessment of the following skills : -- AA1.1, AA1.2 -- AA2.1, AA2.2, AA2.3, AA2.4 -- AA5.3 -- AA6.1 At the end of this course, the students will be able to: -- Understand how the digital circuits (combinational circuits, sequential circuits) work -- Understand the architecture of programmable circuits (FPGA) -- Synthesize and simulate digital circuits in a language such as Verilog or VHDL -- Understand the architecture of a RISC processor -- Use and program a microcontroller -- Understand and implement a digital electronic system *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	The methods of assessment are defined on the course website on Moodle
Teaching methods :	-- Learning is based on courses with compulsory homework. -- Each student has at his disposal during the semester an electronic system comprising an FPGA (Altera Cyclone IV) and and PIC32 microcontroller from Microchip. -- This course is closely linked to the project LELEC2103: Electronic System
Content :	-- Combinational logic -- Sequential logic -- Implementation technology -- Simulation language and Verilog synthesis -- Main logic circuits: arithmetic circuits, memories, programmable circuits -- Architecture and microarchitecture of a RISC processor

	-- Memories (caches, ...) -- Architecture of microcontrollers -- Peripherals and main communication systems
Bibliography :	Digital Design and Computer Architecture - David Money Harris @ Sarah L. Harris - 2007, Elsevier
Other infos :	None
Faculty or entity in charge:	ELEC

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Electro-mechanical Engineering	ELME2M	5	-	🔍
Master [120] in Computer Science and Engineering	INFO2M	5	-	🔍
Master [120] in Electrical Engineering	ELEC2M	5	-	🔍